How to solve cell unbalanced problem for US2000 Pylontech batteries?

Dear Victron Energy Community members,

I have an off-grid solar system with 1 Victron Quattro 48/15000 Inverter, 1 Venus GX, 1 Pylontech battery hub, 3 Victron MPPT chargers and 25 Pylontech US2000 batteries.

I have installed this system since July 2020 on the mobile clinic boat. (Irrawaddy River Doctors Mobile Clinic Youtube Link)

The boat is a non-profit NGO mobile clinic boat (named as **Irrawaddy River Doctors** Mobile Clinic) that provides health care to people living in villages with difficult access to health in the delta of Myanmar. (<u>Foundation Web page link</u>)

In the past the boat used 32nos 12V 200Ah AGM batteries and 48v5000W CyberPower inverter and in July 2020 Victron Inverter, new Solar Panels and Pylontech batteries were replaced and installed.







After installing it, there was an Internal failure alarm, but I was able to use it without any other problems.

However, in March 2023, High Voltage and Low Voltage alarms appeared and even at SOC 80%, the inverter became a shutdown problem.



Therefore, I checked the condition of the battery. I noticed that SOC display leds were not the same with each other.



Then I checked the batteries using battery viewer software and the answers are as follows...

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	49.511	-1.461	38	35	35	3.319	3.323	Dischg	Normal	Normal	Normal	97%	2022-11-29	19:20:18 No
1	49.82	-0.712	38	36	36	3.282	3.326	Dischg	Normal	Normal	Normal	80%	2022-11-29	
2	49.82	-1.004	38	35	36	3,304	3.324	Dischg	Normal	Normal	Normal	96%		19:20:16 N
3	49.826	-1.148	37	35	35	3,319	3.324	Dischg	Normal	Normal	Normal	9696	2022-11-29	
4	49.820	-1.346	36	34	34	3,319	3.323	Dischg	Normal	Normal	Normal	97%	2022-11-29	19:20:16 7
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.814 -1.328	37	34	34	3.32	3.322	Dischg	Normal	Normal	Normal			
.808 -1.304	36	33	34	3.319	3.322	Dischg	Normal	Normal	Normal	97%	2022-11-29	19:3
	Lage(V) Current(A) 1826 -1.514 1824 -1.348 1822 -1.232 1814 -1.328	tage (V) Current (A) separature (V 2026 - 1.514 - 38 2026 - 1.345 - 38 2022 - 1.332 - 38 214 - 1.328 - 37	Stage (V) Current(A) superstruct (C mperstruct (C 325 Lorent mperstruct (C 35 425 -1.514 38 35 422 -1.232 38 35 4314 -1.235 37 34	Specify Current(A) superstruct(C) Lenset Superstruct(C) Mightest superstruct(C) Mightest superstruct(C) M254 -1.248 34 35 36 M254 -1.248 38 35 36 M252 -1.223 38 35 35 M24 -4.328 37 34 34	Specify Current(A) Superstruct (C) Linest (C) Lines	Appen(f) CurrentI(a) mportsure(C appentitue() Lowest appentitue() Nichost appentitue() Lowest appentitue() Lowest appentitue() Lowest appentipentitue()	Appen (*) Current (M) Insert struct (*) Linest (*) Highest (*) Linest (*) Highest (*) Sait (*) <t< th=""><th>Specify Current(k) mpersture(C) Lorent mperstare(C) Hiddet (mperstare(C) Lorent Fights Hiddet Fights Hiddet Fights Lorent Fights Hiddet Fights Hiddet Fights Lorent Fights Hiddet Fights Lorent Fights Hiddet Fights Lorent Fights Hiddet Fights Lorent Fights Lorent Fights Lore</th><th>> Indow State State</th><th>andore Section Contraction (Contraction (Contraction</th><th>3 3 Sale State State</th><th>3 3 Sale State State <!--</th--></th></t<>	Specify Current(k) mpersture(C) Lorent mperstare(C) Hiddet (mperstare(C) Lorent Fights Hiddet Fights Hiddet Fights Lorent Fights Hiddet Fights Hiddet Fights Lorent Fights Hiddet Fights Lorent Fights Hiddet Fights Lorent Fights Hiddet Fights Lorent Fights Lorent Fights Lore	> Indow State State	andore Section Contraction (Contraction	3 3 Sale State State	3 3 Sale State State </th

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1	49,804	-1.386	37	34	35	3.316	3.322	SysError	Normal	Normal	Normal	97%	2022-11-29	1
2	49.794	-1.47	37	34	35	3.318	3.32	Dischg	Normal	Normal	Normal	97%	2022-11-29	B
4	49.825	-1.38	37	35	35	3.321	3.324	Dischg	Normal	Normal	Normal	97%	2022-11-29	F
5	49.815	-1.364	37	34	34	3.319	3.324	Dischg	Normal	Normal	Normal	97%	2022-11-29	
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1	49.813	-0.605	37	34	35	3.275	3.333	Dischg			Normal	7646	2022-11-29	19-14-56 Na
2	49.789	-0.756	38	35	36	3.268	3.327	Dischg	Normal	Normal	Normal	97%		19:15:56 No.
3	49.811	-1.752	.38	35	35	3.319	3.321	Dischg	Normal	Normal		96%	2022-11-29	19:15:56 No.
4	49.821	-1.732	37	35	35	3.318	3.324	Dischg	Normal	Normal	Normal	9678		
5	49.798	-1.57	37	34	35	3.315	3.322	Dischg	Normal	Normal	Normal	90 M	allas-11-af	Description
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1	49.814	-0.972	37	34	34	3.299	3.324	Dischg	Normal	Normal	Normal	87%	2022-11-29	19:15:53 N
2	49.81	-0.444	37	34	35	3.247	3.328	Dischg	Normal	Normal	Normal	96%	2022-11-29	19:15:52 7
3	49.812	-1.274	37	- 34	34	3.319	3.323	Dischg	Normal	Normal	Normal	97%	2022-11-29	19:15:52 7
4	49.805	-1.428	37	33	33	3.318	3.322	Dischg	Normal	Normal	Normal	97%	2022-11-29	19:15:52 7
5	49.809	-1.45	36	33	33	3.319	3.323	Dischg	Normal	Normal	Normal	97%	2022-11-29	19:15:52
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		50.835	4.818	37	31	32	3.107	3.418	Dischg	Normal	Narmal	Normal	25%	353.43.41	15-57-28 No.
	2	51.558	0	37	32	33	3.246	3.452	Dischg	Normal	Normal	Normal	15%		15-57-27 13
	3	50.843	-8.828	35	32	32	3.375	3.494	Dischg	Normal	Normal	Normal	-		15-55.25 No.
OTE 11 PRO	4	50.856	-0.935	35	31	32	3.382	3.394	Dischg	Normal	Narmal	Normal	2016		13-57/27 No.
V THU	8	50.819	-0.55	34	м	31	3.371	3.396	Dischg	Narmal	Normal	Normal	104	3823-83-81	19.37.37 No.

Measurement Result for Batteries SOC Problem (1_3_2023)

	No	SOC 99%	Status	SOC 81%	Status
Group	-		Status		Status
	1	99%		15%	
	2	51%	Cell Voltage OV when Charging	_	Unreachable (Communication Error)
A	3	99%		97%	
	4	98%		95%	
	5	99%		95%	
	1	99%			Sys Error (Internal Communication) / Red Alarm Led is ON
	2	70%	Cell Voltage OV	-	Unreachable (Communication Error)
в	3	99%	Cell Voltage OV	95%	
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	4	99%		95%	
	5	99%		95%	
	1	99%		95%	
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c	3	98%		96%	
	4	99%		95%	
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	1	99%		98%	
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D	3	99%		94%	
	4	99%		95%	
	5	99%		96%	
	1	51%		5%	Sys Error (Internal Communication) / Red Alarm Led is ON
	2	94%		376	Unreachable (Communication Error) / Red Alarm Led is ON
E	3	99%		96%	
	4	99%		95%	
	5	99%		95%	
	5	99%		95%	

I found that most of the batteries had cell imbalance problems and about two batteries had communication problems.

That problem cannot be resolved until now and the battery's performance is further degraded.

Therefore, I submit the measurement results and data. I hope to provide technical support and how to solve the problem as soon as possible.